

## **Appendix 1-B**

### **Policy for City of Lincoln Stormwater Management Issues**

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- A. Encourage voluntary implementation of Better Management Practices (BMP'S) using structural and non-structural measures
  - 1. Utilize both structural and nonstructural BMP's for City of Lincoln's stormwater management program addressing long-term stormwater quality enhancement. Select BMPs for implementation in site-specific projects or basin master plans that are effective, reasonable, and cost-effective.
  - 2. Encourage implementation of voluntary nonstructural BMPs: use of appropriate vegetation to reduce the need for fertilizer, pesticides, and irrigation; provision of incentives to set aside more open space; preservation of more riparian zone or other environmentally sensitive areas than required by local, state or federal regulation; preservation or reestablishment of riparian vegetation.
  - 3. Encourage implementation of voluntary structural BMPs; intentional creation of temporary ponding areas on parking lots and in landscaped or turfed open areas of building sites during the design process; maximize use of pervious surfaces in the constructed environment; disconnection of impervious areas from the storm drain system; use of constructed wetlands; incorporation of permanent pools and other water quality enhancement features into storage facilities.
  - 4. Provide explicit guidance documents on design, installation, and maintenance of BMPs and provide education so reviewers, developers, contractors, and inspectors understand the purpose and function of BMPs.
  - 5. Develop a management program to control pollutants as required for Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit compliance.

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- B. Implement a joint program between the City and the NRD to review and enforce Storm Water Pollution Prevention Plans (SWPPP) on all construction sites 2 acres or greater that will be designed by qualified erosion control designers and utilize appropriate structural and non-structural BMP's.
1. Draft and execute interlocal agreements with the NDEQ to allow review and approval of Lincoln NPDES Notice Of Intent (NOI) and Storm Water Pollution Prevention Plan (SWPPP) submittals by the LPSNRD.
  2. Require submittal and approval of NPDES NOI and SWPPP before land disturbance or vegetation removal activities occur on any site greater than 2.0 acres. If the SWPPP is prepared by and carries the seal of a licensed Professional Engineer, Architect, or Landscape Architect; or is prepared by an International Erosion Control Association Certified Professional in Erosion and Sediment Control (CPESC) it shall be given automatic approval. However, if the SWPPP is prepared by someone other than those listed above the NRD shall review the SWPPP, and after review notify the landowner/land developer of approval or denial within seven (7) days after receipt of the SWPPP. If the SWPPP has been denied, it may be revised and resubmitted for approval. If the approval or denial has not been received within such seven (7) day period by the landowner/land developer, then the SWPPP shall be deemed approved.  
  
As one condition of approval, require a construction schedule which indicates installation of as many of the BMPs as are feasible before any land disturbing activity is conducted, including site grubbing. The schedule will also indicate a plan to limit exposure of disturbed land to the shortest reasonable period of time.
  3. Monitor and enforce compliance with NPDES Permit requirements.
    - A. Cross-train selected building and safety personnel, public works inspectors, and NRD staff to check for appropriate implementation and maintenance of BMPs during each visit to construction sites. Establish City authority to suspend all project site work (with reasonable advance notice to cure) if BMP implementation and maintenance are not in good order.
    - B. LPSNRD and/or City will periodically perform construction site observations to check proper implementation and maintenance. In accordance with LPSNRD/City/NDEQ interlocal agreement, periodic inspection of construction sites will be made.
  4. Develop and fund an appropriate BMP information and education program for the public, contractors, builders, engineers and developers.
    - A. Provide annual erosion and sediment control continuing education courses to promote public awareness and to provide training for contractors, designers, developers, and enforcement personnel in application, implementation, and maintenance of construction site BMPs.
    - B. Modify the Lincoln Building Permit to provide information to builders and owners about responsibilities they may have under the NPDES Permitting program to implement, preserve, or maintain BMPs.
    - C. Prepare a BMP informational handout and a presentation for use at trade shows, schools, neighborhood associations and civic group meetings.

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- C. Minimize Localized Flooding by encouraging better design of subdivisions to create and protect overflow routes for run-off from major storm events.
1. Formalize the City monitoring of stormwater system performance in developed areas to identify problem areas. Analyze and develop retrofit solutions where possible and appropriate. Provide technical support to assist homeowners and neighborhood officials in recognizing and resolving local problems.
  2. Continue minor system design based on 5-year to 10-year frequency storms depending on the design application. During design, determine the hydraulic grade line for all enclosed systems to confirm that inlets act as inlets, not outlets. Use the 100-year return frequency storms for design of the major system in all new developments.
  3. Runoff from major storms (i.e., 1% chance of recurrence, a.k.a. 100-year storms) should pass through a development without flooding buildings or homes. Overland flow routes must be provided using streets, swales, and open space, etc. Current design standards provide guidance to design the minor system (inlets, pipes, and small channels) but need refinement to complement the design standards required to address major storms.
  4. Require stormwater flowage and maintenance easements that prohibit placement of structures, fences, change of grade, elevation, or contour without written consent of the City Engineer. All easements for storm drain pipe should be a minimum of 30 feet wide. In situations where the Project Engineer can clearly demonstrate that an easement less than 30 feet is adequate, the City may consider such a request. Easements for storm drain pipe and surface water flowage shall be used where a drainageway must be maintained to carry stormwater flow in excess of the storm drain pipe capacity. The easement cross-section must accommodate the depth and width of flow from the 100-year storm. The width must also be designed to allow for access of maintenance equipment. Implement a program to assure proper construction and maintenance of easement flow capacity.
  5. Subdivision grading plans should show setback lines for a proposed development. Grade lots to drain from setback lines to street or perform analysis to show that not doing so will not result in flooding from the major storm. Grade lots so buildable area will be outside the limits of the area flooded by the major storm, from the upper-most inlet location to the downstream project limits. Provide design nomographs for street right-of-ways and channel capacities in the Drainage Criteria Manual to facilitate determination of water surface limits. Flood level information considered or generated during the development design process will be made available for use by builders in the Building and Safety Department permit process and subsequent prospective buyers.
  6. Require that elevational difference between the finish floor and low opening of new buildings and the top of curb at the upper lot line ( or lot line adjoining drainage easements) be indicated on the Building Permit application. Compare this information to available flood level information before approval. Add a statement to the Building Permit Application which indicates by signing the application the applicant has taken into account available information when setting finish floor and low opening levels.
  7. Provide public right to inspect private stormwater facilities and perform necessary maintenance to assure proper operation. Determine how public costs incurred to accomplish necessary maintenance will be recovered.

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- D. Minimize Flooding Along Tributaries and Drainageways.
1. Regulate development in Federal Emergency Management Agency Flood Insurance Study (FIS) delineated floodplains in accordance with the current floodplain regulations.
  2. Through the watershed master planning process, develop approximate 100-year projected future conditions flood profiles for mainstem and tributary channel corridors that are between the limits of detailed study by FIS and the boundary of the uppermost 150-acre sub-basin(s). Once the master plan flood profiles have been accepted by the City, regulate new development along the channel areas so the lowest opening in new buildings is protected from the flood profile.
  3. In watersheds where FIS floodplains have not been delineated and where flood prone areas have not yet been determined through the watershed master planning process, regulate new development so the lowest opening of adjacent new buildings is protected to one foot above the calculated 100-year flood profile.
  4. In all watersheds where a FIS floodway has not been delineated, development shall preserve a corridor with a minimum width equal to the channel bottom width, plus 60 feet, plus six times the channel depth. The corridor width will be centered on the channel and be delineated along all channels with a drainage areas exceeding 150 acres..
  5. Regulate new development so it does not occur within minimum corridors. Riparian vegetation within the identified flood corridors shall be preserved to the maximum extent practicable, or acceptably mitigated, during the development planning and construction processes. Encroachments of the riparian vegetation will be permitted to provide for OM&R, channel improvements, stormwater storage facilities, public parks, pedestrian/bike trails, other recreational uses, utility crossings, streets and driveways, and other public purposes.
  6. Flood corridors delineated during development of land shall be legally described and recorded.
  7. To preserve riparian characteristics of channels, design channel improvement or stabilization projects to minimize use of visible concrete, riprap, or other hard stabilization materials.
  8. Design culvert or bridge structures which cross the channel to convey a 50-year frequency peak flow rate (for projected future conditions) without over-topping the roadway and without increasing the 100-year flood level (even under overtopping conditions) unless a flood storage easement upstream of roadway can be obtained.

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- E. Improve the design and construction of stormwater storage (detention/retention) facilities and, when appropriate, use regional storage facilities.
1. Where feasible, use strategically-located regional stormwater storage facilities to reduce flow peaks from major storm events. Evaluate downstream impacts of regional facilities. Select regional facility sites and reserve required land before development occurs, when possible. Develop funding mechanisms to allow joint investment by benefitted parties in regional facilities. These facilities will be constructed, operated and maintained by the City or LPSNRD. Require on-site detention storage unless the master planning process or a regional analysis has shown that the detention requirement can be transferred to a regional stormwater storage facility, which is determined to be of regional benefit to the storm drainage system by the City and NRD. Due to the fact that stream channel degradation is a major cause of stormwater-related water quality problems in Lincoln, on-site detention facilities may still be necessary to provide maintenance of receiving stream channel stability, maintenance and water quality enhancement.
  2. Design on-site and regional stormwater storage facilities with adequate access and sediment storage right-of-way to facilitate maintenance.
  3. Design on-site and regional stormwater storage facilities with adequate access and sediment storage right-of-way to facilitate maintenance. Include sediment-trapping forebays and maintenance-friendly measures in stormwater storage designs.
  4. Use the actual hydrologic conditions encountered on the site to determine peak release rates for existing conditions.
  5. Require submittal of hydraulic design calculations of outlet works to document that major and minor storm peak flows will be attenuated to existing conditions. To promote channel stability, require on-site stormwater storage facilities to also attenuate 2-year peak flow rates to existing conditions.
  6. Require that record drawings of stormwater storage facilities be provided to the City.
  7. Unless private maintenance of on-site stormwater storage facilities is acceptably performed, provide necessary maintenance with government forces. Equitably allocate costs incurred to responsible parties.